5005-B1-41 **Felix J. Herrmann*** (fherrmann@eos.ubc.ca), 6339 Stores Rd, Vancouver, Vancouver, BC V6T 1Z4, Canada. *Compressive seismic imaging.*

Seismic imaging involves the solution of an inverse-scattering problem during which the energy of (extremely) large data volumes is collapsed onto the Earth's reflectors. We show how the ideas from 'compressive sampling' can alleviate this task by exploiting the curvelet transform's 'wavefront-set detection' capability and 'invariance' property under wave propagation. First, a wavelet-vaguellete technique is reviewed, where seismic amplitudes are recovered from complete data by diagonalizing the Gramm matrix of the linearized scattering problem. Next, we show how the recovery of seismic wavefields from incomplete data can be cast into a compressive sampling problem, followed by a proposal to compress wavefield extrapolation operators via compressive sampling in the modal domain. During the latter approach, we explicitly exploit the mutual incoherence between the eigenfunctions of the Helmholtz operator and the curvelet frame elements that compress the extrapolated wavefield. This is joint work with Gilles Hennenfent, Peyman Moghaddam, Tim Lin, Chris Stolk and Deli Wang. (Received May 31, 2007)